

I CLAIM:

1        1. A segmented scleral expansion band adapted for  
2        implantation within or fastening to a zone of the sclera of an  
3        eye lying outside of and adjacent to the ciliary body of the  
4        eye, said segmented scleral expansion band comprising  
5                a plurality of adjacent arcuate segments, each segment  
6        having a curved anterior edge and a curved posterior edge and  
7        structural spacing means extending between said anterior edge  
8        and said posterior edge and rigidly spacing said edges apart,  
9                each segment having lateral ends provided with means for  
10      fastening said ends of said adjacent segments together to form  
11      a band,  
12                said anterior edges and said posterior edges forming,  
13      when assembled into said band, an anterior rim and a posterior  
14      rim, respectively, of said band, and  
15                said segments being sized so that said anterior rim of  
16      said band will lie outside at least a portion of an anterior  
17      portion of said scleral zone and said posterior rim will lie  
18      outside at least a portion of a posterior portion of said  
19      scleral zone,  
20                at least one of said anterior rim, said posterior rim and  
21      said spacing means having a diameter greater than the exterior  
22      diameter of said scleral zone adjacent thereto.

1       2. The scleral expansion band of Claim 1 wherein said  
2 fastening means comprises a tongue adapted to engage a recess  
3 on an adjacent segment.

1       3. The scleral expansion band of Claim 2 wherein said  
2 recess is a groove.

1       4. The scleral expansion band of Claim 1 wherein said  
2 band is made of a synthetic resin.

1       5. The scleral expansion band of Claim 4 wherein said  
2 synthetic resin is selected from the group consisting of  
3 poly(methyl methacrylate), polyethylene, polypropylene,  
4 poly(tetrafluoroethylene) and silicone resins.

1       6. The scleral expansion band of Claim 1 wherein said  
2 band is made of a reinforced composite material.

1       7. The scleral expansion band of Claim 6 wherein said  
2 reinforced composite material is a glass-fiber reinforced  
3 synthetic resin.

1       8. The scleral expansion band of Claim 6 wherein said  
2 reinforced composite material is a carbon-fiber reinforced  
3 material.

1       9. The scleral expansion band of Claim 6 wherein said  
2 reinforced composite material is carbon-fiber reinforced  
3 carbon.

1       10. The scleral expansion band of Claim 1 wherein said  
2 band is made of a physiologically acceptable metal.

1       11. The scleral expansion band of Claim 10 wherein said  
2 band is made of metal selected from the group consisting of  
3 titanium, platinum, gold, tantalum, stainless steel, shape-  
4 memory alloys, and physiologically acceptable alloys.

1       12. The scleral expansion band of Claim 1 wherein said  
2 band is made of a ceramic material.

1       13. The scleral expansion band of Claim 12 wherein said  
2 ceramic is selected from the group consisting of porcelain,  
3 alumina, silica, silicon carbide, and high-strength glasses.

1       14. A segment of a scleral expansion band adapted to be  
2 assembled to form a scleral expansion band, said segment  
3 comprising  
4           a curved anterior edge and a curved posterior edge and  
5           structural spacing means extending between said anterior edge  
6           and said posterior edge and rigidly spacing said edges apart,

7        said segment having lateral ends provided with means for  
8    fastening said ends to adjacent segments to form a band.

1        15. The segment of Claim 14 wherein said fastening means  
2    comprises a tongue on one of said lateral ends and a groove on  
3    another of said lateral ends.

1        16. The segment of Claim 14 wherein said anterior edge  
2    has a radius of curvature of about 8.0 to about  
3    8.5 millimeters.

1        17. The segment of Claim 16 wherein said anterior edge  
2    has a radius of curvature of about 8.3 millimeters.

1        18. The segment of Claim 14 wherein said posterior edge  
2    has a radius of curvature of about 10.0 to about  
3    10.5 millimeters.

1        19. The segment of Claim 18 wherein said posterior edge  
2    has a radius of curvature of about 10.3 millimeters.

1        20. The segment of Claim 14 wherein said segment is  
2    made of a synthetic resin.

1        21. The segment of Claim 20 wherein said synthetic  
2    resin is selected from the group consisting of poly(methyl

3 methacrylate), polyethylene, polypropylene, poly(tetra-  
4 fluoroethylene) and silicone resins.

1           22. The segment of Claim 14 wherein said segment is  
2 made of a reinforced composite material.

1           23. The segment of Claim 22 wherein said reinforced  
2 composite material is a glass-fiber reinforced synthetic  
3 resin.

1           24. The segment of Claim 22 wherein said reinforced  
2 composite material is a carbon-fiber reinforced material.

1           25. The segment of Claim 24 wherein said reinforced  
2 composite material is carbon-fiber reinforced carbon.

1           26. The segment of Claim 14 wherein said segment is  
2 made of a physiologically acceptable metal.

1           27. The segment of Claim 26 wherein said segment is  
2 made of metal selected from the group consisting of titanium,  
3 platinum, gold, tantalum, stainless steel, shape-memory  
4 alloys, and physiologically acceptable alloys.

1           28. The segment of Claim 14 wherein said segment is  
2 made of a ceramic material.

1        29. The segment of Claim 28 wherein said ceramic is  
2 selected from the group consisting of porcelain, alumina,  
3 silica, silicon carbide, and high-strength glasses.

1        30. A method for restoring the amplitude of  
2 accommodation of an eye comprising forming at least one  
3 circumferentially oriented tunnel in the tissue of the sclera  
4 of an eye in a circumferential zone of the sclera lying  
5 outside the ciliary body of said eye, inserting in said  
6 tunnels segments of a scleral expansion band, and joining said  
7 segments to form a scleral expansion band,  
8        each of said segments of said scleral expansion band  
9 having a curved anterior edge and a curved posterior edge and  
10 structural spacing means extending between said anterior edge  
11 and said posterior edge and rigidly spacing said edges apart,  
12        each of said segments of said scleral expansion band  
13 having lateral ends provided with means for fastening said  
14 ends of said adjacent segments together to form a band,  
15        said anterior edges and said posterior edges forming,  
16 when assembled into said scleral expansion band, an anterior  
17 rim and a posterior rim, respectively, of said band, and  
18        said segments of said scleral expansion band being sized  
19 so that said anterior rim of said band will lie outside at  
20 least a portion of an anterior portion of said scleral zone

21 and said posterior rim will lie outside at least a portion of  
22 a posterior portion of said scleral zone,  
23 at least one of said anterior rim, said posterior rim and  
24 said spacing means having a diameter greater than the exterior  
25 diameter of said scleral zone adjacent thereto.

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